

## 2.1

# Traveling to School

## At a Glance

PACING 1 day

### Mathematical Goals

- Group numerical data in equal intervals and display their distribution using a stem-and-leaf plot
- Find measures of center and variation, including range and how data vary from the least to the greatest values, when a distribution is displayed using a stem-and-leaf plot

### Launch

Display Transparencies 2.1A and 2.1B. Refer students to the table of data and the first two questions in the Getting Ready. Have them work on the questions for a few minutes before you have a whole-class discussion.

- *Look at the table of data. What are the three questions that the students asked to collect this data?*
- *Describe how you think they collected the data to answer each of these questions.*

Refer students to the third question in the Getting Ready.

- *Would a line plot be a good way to show the travel-time data? Why or why not?*

When students are familiar with the data, introduce the problem of making a stem-and-leaf plot to represent the data. The Student Edition outlines how to develop stem-and-leaf plots. We do not recommend that you have students read through this process on their own. Instead, we encourage you to present the process as a class exploration led by you. You may need to review the idea of the tens digit.

### Materials

- Transparencies 2.1A–C
- Local street map (optional)

### Vocabulary

- stem-and-leaf plot

### Explore

Students will complete the stem-and-leaf plot in Question A. For Question B, work with students to rearrange these leaves so they are in order. Transparency 2.1C shows the stem and-leaf plot before and after arranging the data in ascending order. Help students add a title and key for the stem plot.

For Questions C and D, remind students as they select the interval to explain their reasoning. For Question E, some students may have trouble finding the median. You can help them by asking how finding the median on the stem-and-leaf plot is similar to finding the median when the data is represented in an ordered list. Check to see that all students are recording their strategies and are ready to explain them. Make note of the strategies you want to have students share in the Summary.

## Summarize

Ask questions that focus on reading the stem plot and on identifying intervals.

- What is the shortest time for the 1 stem?
- What possible times are not shown for the 1 stem?
- We say that the interval of possible times for the 1 stem is from 10 to 19 minutes. What is the interval of possible times for the 0 stem?

Have pairs share their answers with the whole class. Make sure students explain their reasoning. Before you leave Problem 2.1, spend some time working with them to “read beyond the data.”

- How can we describe the shape of the data when they are grouped by tens?
- Using the mode probably won’t tell us too much about the data with this graph. Why do you think this is so? Could we talk about an interval that contains the most data points?
- How would we find the median for this set of data?

## Materials

- Student notebooks

## ACE Assignment Guide for Problem 2.1

**Differentiated Instruction**  
Solutions for All Learners

Core 1–4

Adapted For suggestions about adapting ACE exercises, see the *CMP Special Needs Handbook*.

## Answers to Problem 2.1

A.

|   |                                 |
|---|---------------------------------|
| 0 | 8 8 5 5 5 6                     |
| 1 | 5 5 5 9 5 5 7 5 0 5 0 5 1 7 0 0 |
| 2 | 2 5 0 5 0 0 0 0 1               |
| 3 | 0 5 0 0 5                       |
| 4 |                                 |
| 5 | 0                               |
| 6 | 0                               |

## B. Student Travel Times to School

|   |                                 |
|---|---------------------------------|
| 0 | 5 5 5 6 8 8                     |
| 1 | 0 0 0 0 1 5 5 5 5 5 5 5 5 7 7 9 |
| 2 | 0 0 0 0 0 0 1 2 5 5             |
| 3 | 0 0 0 5 5                       |
| 4 |                                 |
| 5 | 0                               |
| 6 | 0                               |

Key: 2 | 5 means 25 min

- C. Most students will reason that those students who have the shortest travel time (times in the 0–9 min interval) probably sleep the latest. However, because of other variables, times in the 10–19 min interval may be chosen.
- D. Students who have longer travel times (the 50 min and 60 min outliers) probably get up the earliest.
- E. 16 min; possible explanation: To find the median, count in from both ends of the plot until you reach the midpoint. It is between 15 and 17 min, so the median is 16 min.
- F. 55 min; possible explanation: The range is the difference between the greatest value on the plot and the least value:  $60 - 5 = 55$ .